

Niagara Potato Dusts

NIAGARA SPRAYER COMPANY
MIDDLEPORT, N.Y.



Dusting Irish Potatoes

Results from
Florida to
Nova Scotia.

Dusting Irish potatoes with a copper dust plus a poison for diseases and insect pests has been practiced for the past three years from Florida to Maine and Nova Scotia by growers and by experiment station investigators. The results secured have been so remarkable and so satisfactory that potato growers everywhere are demanding dusting machines and materials to save their potatoes.

Only 10
Per Cent. of
Potato Crops
Protected.

Prof. H. H. Whetzel, head of the Department of Plant Pathology, Cornell University, addressing the New York State Potato Association, said that not ten per cent. of potato growers sprayed their vines for blight because of the extreme labor and annoyance of such tasks. Yet the advantage of sprayed over unsprayed crops had been completely demonstrated.

Growers
Eager
to Learn.

Continuing, Prof. Whetzel described how the "extension men" of New York State College of Agriculture found growers eager to learn of the dusting method of insecticide and fungicide because of the innumerable difficulties of spraying. The specialist in plant diseases reviewed spraying and dusting results and continued:

**Dusted
Vines
Superior.**

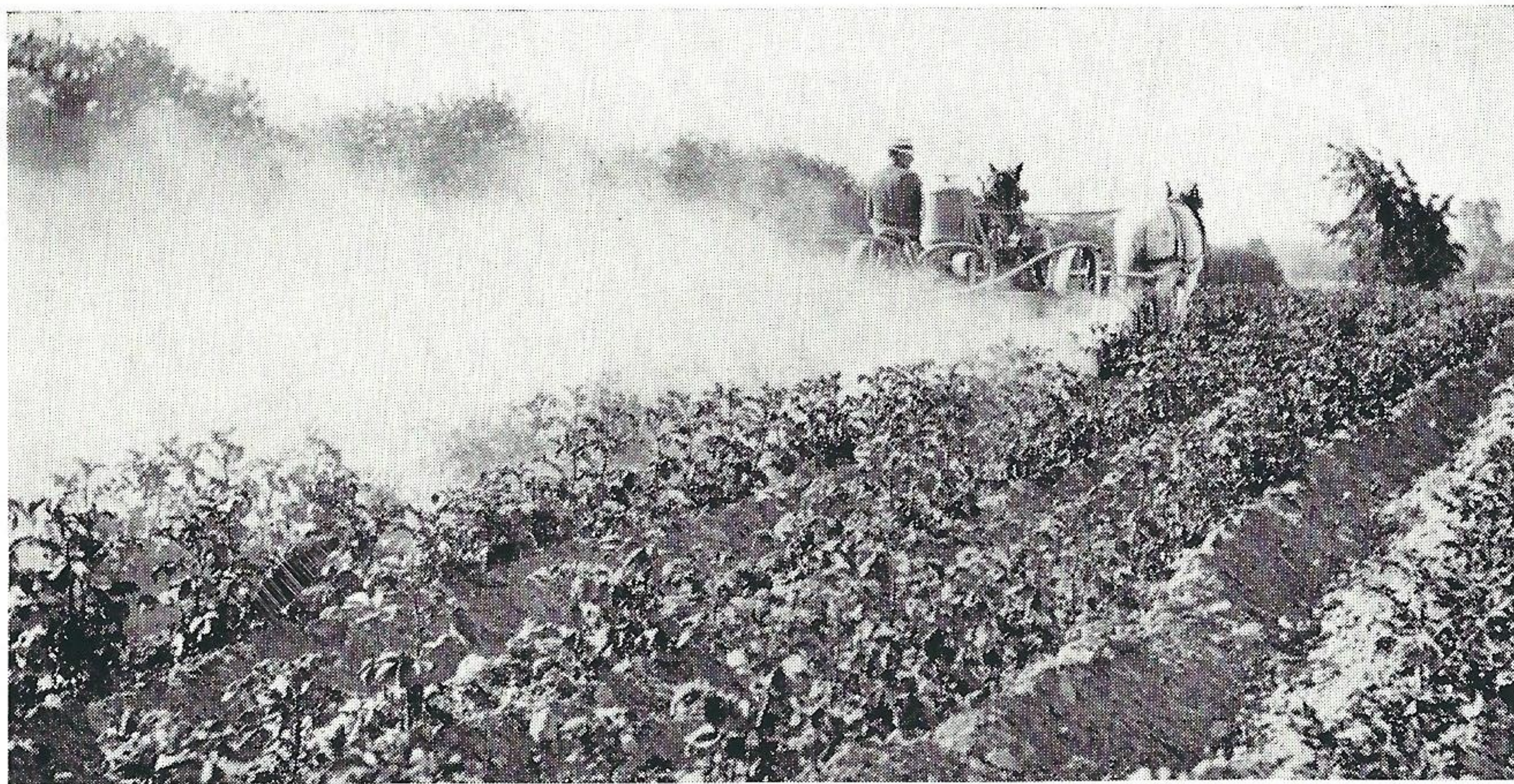
"The dusted vines had a more vigorous appearance than those of sprayed vines. It was also noted that the dust almost completely prevented tip burn and was very effective against flea beetle." (Send for copy of Prof. Whetzel's address. Cornell University or the Niagara Sprayer Company will send it to any address post paid.)

**More Direct
Than
Spraying**

Dusting is not different from liquid spraying in its principle of killing insects and diseases. Stop a moment to consider that no liquid spray applied to potatoes accomplishes its work while in a liquid form. The liquid must first dry upon the vines before it is effective. Thus there is deposited on the plant a thin film of dry material left after the evaporation of the water.

**One Step
Eliminated.**

In dusting practically the same materials are blown dry upon the potatoes and thus the vines are covered with a thin film of powder without that intermediate step of the evaporation of water. Dusting utilizes air as a carrier instead of water, which is merely a carrier in liquid spraying. The finely pulverized dust atoms remain upon the surface of foliage just as dust particles cling to the surface of an automobile windshield despite wind and rain.



Niagara Power Potato Duster at Work, Showing Envelopment of Vines by Dust, and "Drift" Which in Time Settles on Vines.

No Time
or Labor
Hauling
Water.

No time is occupied in driving to and from water sources, filling and re-filling spray tanks. **Dust mixtures** for one-half a day's work can be carried on the machine, or the cans containing potato mixtures required for the day's work can be distributed at the end of the rows in the potato field.

Dusters
Simpler Than
Spray-rigs.

Duster machinery is simpler and cheaper than spray machinery. No leaky pumps, clogged nozzles, bursting hose, in dusters. The number of parts in a duster as against any spray-rig comparable in size is less than one-third.

For Small
Acreages.

For small acreages dusting is more pleasant and satisfactory because hand dusters are easier to operate, covering a larger area, more cleanly, and considered pound for pound when filled, are lighter than liquid-sprayers covering the same acreage.

Dusting Costs
Less Than
Spraying.

Less Cost—Dusting is cheaper. The equipment cost, machinery depreciation, operation of the machine, time and labor required, are all much less in dusting. The dusting materials are more expensive. But considering labor and all other expenses which finally enter into the cost of protecting the potato crop against bugs and blight, the dusting method is decidedly cheaper than liquid spraying.

**Acreage
Covered.**

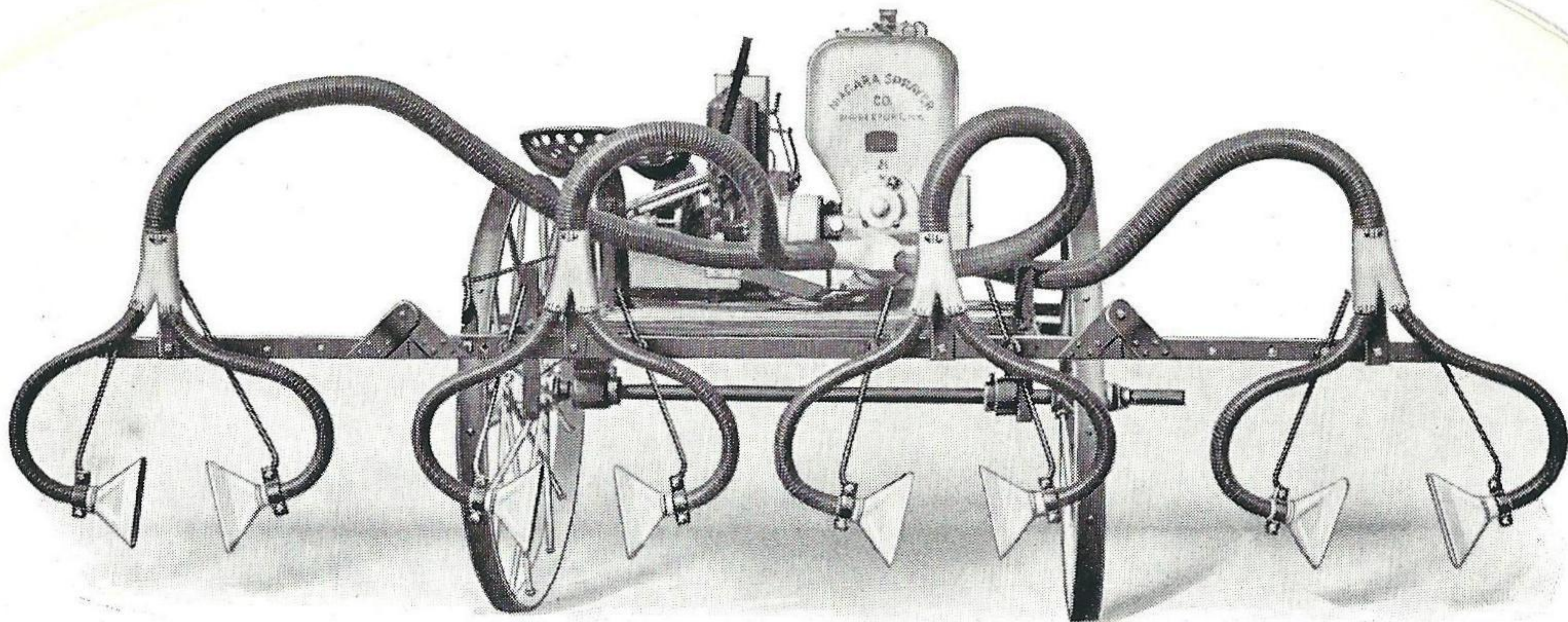
The **Niagara Power Potato Duster**, horse-drawn and the Duster operated by a Pierson 5-H. P. Water-Cooled Motor, easily dusts 30 acres of potatoes a day under average conditions. The **Niagara Traction Potato Duster**, horse-drawn and the Duster operated by a roller chain from axle to Duster gears, easily dusts 20 acres a day. The **Niagara Hand Blower Gun** covers one-half acre an hour. Dusters, power, traction, or hand, will cover twice to three times the area that spray-rigs or hand sprayers will cover.

**Dust Clouds
in Place of
Mists.**

Can a spray rig compete against a duster? Growers can answer. Think of the horses hauling tank-loads of water, tons of it in the course of a day, through the fields, with time lost in filling and re-filling, measuring and mixing spray materials to the right degree of solution. In dusting dry powder is blown upon plants in clouds, while in spraying poison mixtures are carried in watery mists to potato vines.

**Dusters
Weigh Far
Less Than
Spray Rigs.**

The weight complete of the **Niagara Potato Dusters** follows: **Power Duster, 1,028 pounds; Traction Duster, 800 pounds; Hand Blower Gun, 11 pounds.** All models are much lighter than corresponding models of liquid sprayers, dusters loaded for operation weighing only one-half to one-third as much as liquid sprayers.



Niagara Power Potato Duster. Aluminum. Hyatt Roller Bearings. Aluminum Fan, Revolving 3,000 Times a Minute. Flexible Metal Hose Conveying Dust to Aluminum Nozzles. Dusts 4 Rows and 30 Acres a Day. Equipped with 5-H.P. Pierson Water Cooled Motor, on Two-Wheeled Cart with Extension Axles, Adjustable to from 60 to 72 Inches Over Plant Rows.

Effectiveness of Dusting

Vine Stimulation.

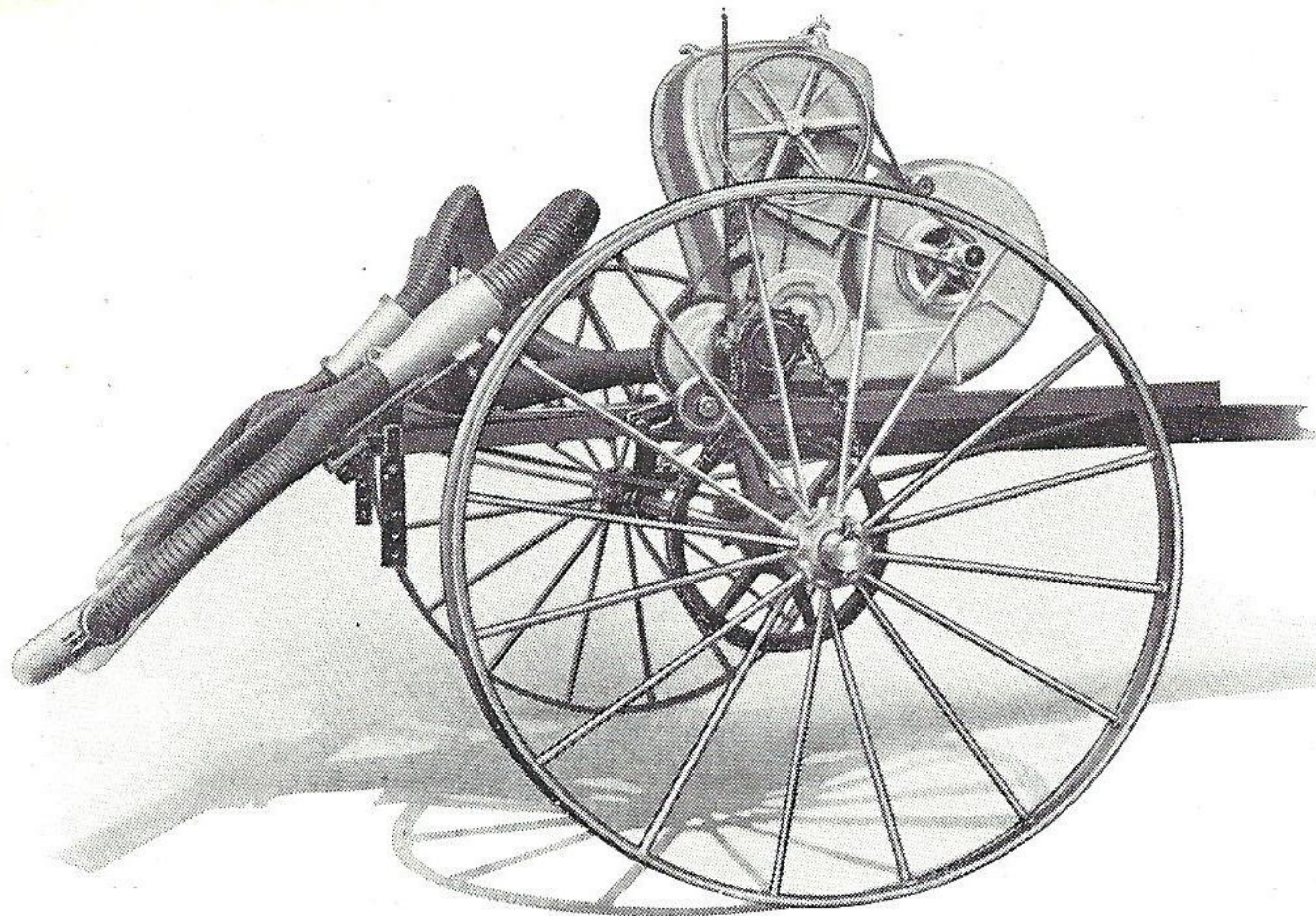
The common potato diseases and insects susceptible to control by spraying have been controlled fully as well by dusting. (See "Evidence.") It has been abundantly demonstrated that Bordeaux mixture stimulates the growth of potato vines, apart from the disease and insect control, and this stimulation alone, with its correspondingly increased yields, is generally sufficient to warrant the expense of the Bordeaux in seasons of no blight. Copper Sulphate applied in the dust form has produced greater stimulation of the potato plant than did Copper Sulphate applied in the liquid Bordeaux mixture, due to the more thorough covering with the dust.

Dusting With Horse (Traction) Power.

20 Acres
a Day.

Traction Potato Duster—Model C-22-P

The **Niagara Traction Potato Duster** is mounted on a cart with two 4-foot iron wheels and has an extension axle permitting a wheel or tread adjustment from 60 to 72 inches, so that the Duster can straddle rows of varying width. This Duster straddles four rows of potatoes, dusting that number at a time, and covers 20 acres a day under ordinary



Niagara Traction Duster. Side View, Showing 4-foot Cart Wheels, Giving Axle Clearance Over Vines, Nozzles Tilted to Pass Obstructions, and Sprocket Chain Running from Axle to Pulleys on Side of Aluminum Dust Machine to Operate Fan and Feed Gear.

conditions. The cart is drawn by one or two horses, and power to operate the Duster is conveyed from the cart wheel axle to the duster by a steel roller chain. **The complete weight of Model C-22-P is only 800 pounds**, and, owing to the special fan construction in this duster, the draft of the outfit ranges from 76 to 125 pounds. Therefore two horses pull this duster all day with but moderate effort.

Aluminum
Lessens
Weight

Aluminum castings are used throughout the construction of the duster itself. The hopper holds 80 pounds of dust or enough for four acres. **A patented gear feed** in the bottom of the hopper forces the dust through a perforated plate into the air chamber below, where the current of air catches the dust and carries it out on to the vines. This **gear feed** also crushes all lumps of dust, thus insuring fineness in the material, for otherwise lumps would simply roll off the plants.

Definite
Feed Device.

By means of a series of belt pulleys and of a hand lever conveniently located at the top of the hopper, the quantity of dust being discharged can be set definitely to any amount desired. From 10 to 45 pounds per acre can be applied. This duster is equipped with either the patented gear feed or the brush feed, as the purchaser desires. Unless otherwise specified, the gear feed is supplied.

**Distributing
System.**

Delivery tubes of **flexible metal hose** convey the dusting material from the duster to the nozzles. These delivery tubes and the aluminum nozzles are fastened to a strong steel bar. The entire distributing system is built very strongly and durably so as to withstand hard wear and severe jolting. It is also quickly adjustable to suit the height of the potatoes and width of rows and the dust can be directed from the nozzles at any angle desired. This feature is very important when controlling Potato Lice which infest the under side of the leaves.

The **Niagara Traction Potato Duster** will **dust 20 acres of potato vines a day**, under average circumstances. One man drives and operates the duster, stopping every four acres to refill hopper.

Power Potato Duster—Model F-22-P

**Dusting with
Motor Power.**

The **Niagara Power Potato Duster** is similar to the **Niagara Traction Duster** except it is operated by a Pierson 5-H. P. water cooled motor. The horses merely draw the 1,028 pounds weight of the complete outfit.

**Brush Feed
Device.**

This model is usually equipped with the patented brush feed and the quantity of dust applied to the crop is regulated by a slight turn of the hand lever at the top of the hopper.

**30 Acres
a Day.**

Model F-22-P dusts 30 acres of potatoes daily under ordinary conditions. The hopper holds 100 pounds of dust, sufficient for 5 acres.

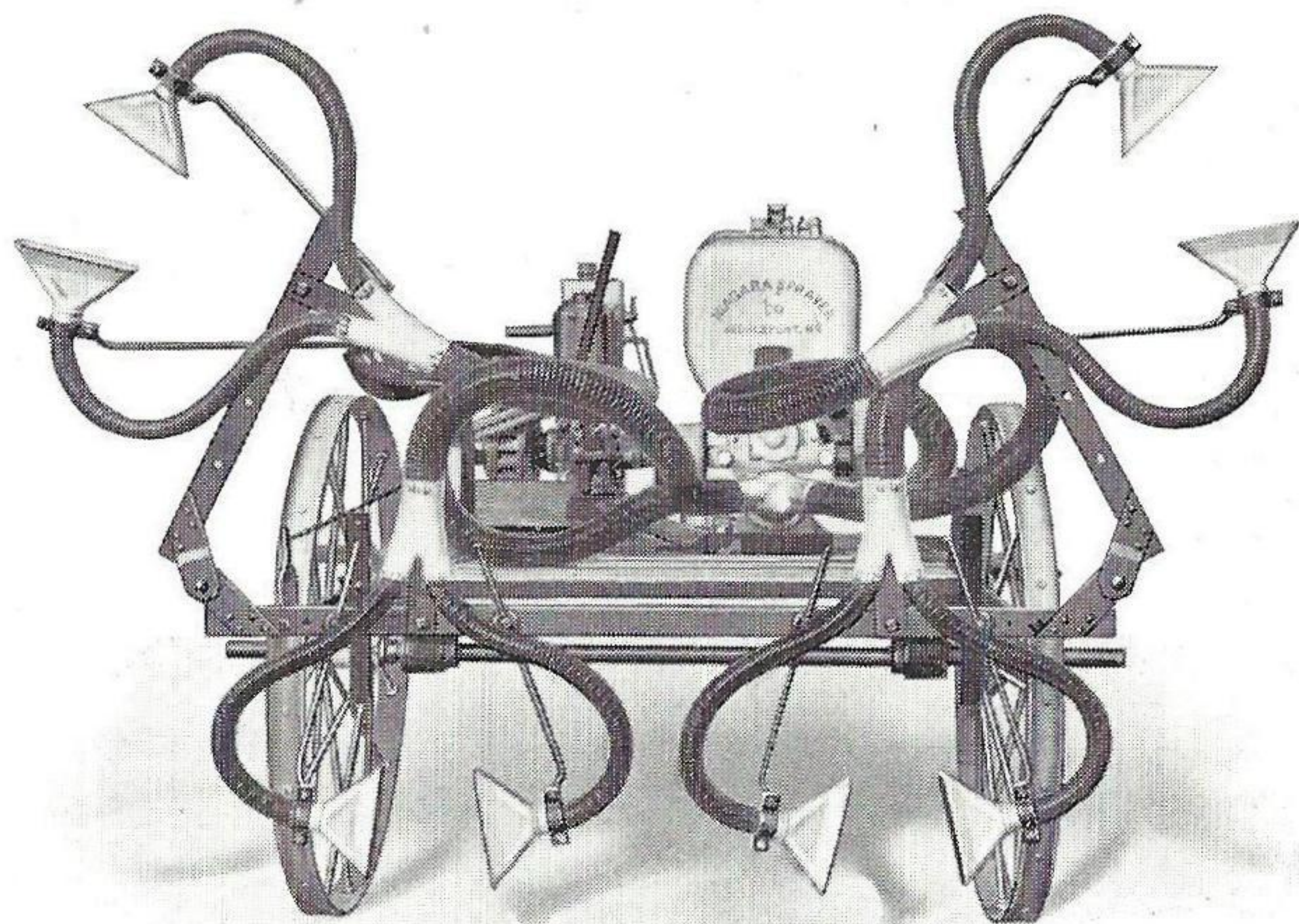
Power.

A **special orchard attachment** can be secured for the **Niagara Power Potato Duster** and the change can be made in ten minutes. The eight nozzles and tubes are removed and a single 4-inch reinforced rubber hose is attached to the duster. The other end of this hose is fastened to a 4-inch straight discharge pipe 4 feet long. An extension platform is bolted onto the rear of the potato duster frame. One man stands on this platform and handles the discharge pipe to direct dust onto trees and another drives the team. With the orchard attachment this machine dusts trees 15 to 20 feet high. Thus equipped **Model F-22-P** is an excellent combination orchard and potato duster.

**Combination
Potato and
Orchard
Duster.**

Repairs.

After the duster is in operation, it will require practically no adjustments. All bearings and wearing surfaces are well lubricated and do not come in contact with the dusts. The duster is strongly constructed, has few parts, and its mechanism is very simple; thus the necessity for repairs is reduced to the minimum. However, if through accident, carelessness or other causes, repairs are needed, we are prepared to give very prompt and efficient service.



Niagara Potato Duster. Distributing Arms Folded to Pass Gates.

Niagara Hand Dusters

Dusting by Hand.

The **Niagara Hand Blower Gun** is suspended from the shoulders by broad straps, which pass over the shoulders and across the back. To operate this duster requires but an easy circular movement of the hand and arm. The fan and the brush feed furnish an even, constant flow of dust. Inside the hopper is a slide with a thumb screw for altering the quantity of dust delivered to the vines.

Hopper Contents Will Cover $\frac{1}{2}$ of an Acre.

The **Niagara Hand Blower Gun** dusts one row at a time. The fan-like shape outlet of the delivery tube can be turned to direct the dust at any desired angle. The hopper holds 8 pounds of dust or sufficient for $\frac{1}{2}$ acre at one filling. This duster will readily care for 2 to 4 acres of potatoes a season. Its construction is very ingenious, simple, and durable.

Dust Gun Extremely Light.

The **Niagara Dust Gun** is very useful in the home potato patch and home garden. The dust mixture is put into the hopper at one end of the round barrel and then, by working the handle back and forth, a continuous cloud is thrown onto the plants. Its extreme lightness and simplicity make it very convenient to use.

Niagara Potato Dusts

Niagara
Dust
Mixtures.

Niagara dusting materials are ground to such a fineness that the tiny particles will pass through a screen having 200 meshes to the inch. These tiny particles of dusting materials are so fine that they lodge securely in the pubescence or tiny hairs which cover the leaves and stems of vines and cling there despite rains. Dusts of proper fineness adhere to vines fully as long as spray materials.

Fungus
Protection.

Ordinarily the potato crop should be dusted with D-18 or D-5 dust mixtures for the first two applications. These are for both bugs and blight and similar pests. Potato Bugs are seldom a menace after the second dusting, so that thereafter for the later applications D-6 mixture should be used, as it is a fungicide alone. If Aphids and other sucking insects appear, substitute Mixture 138 or apply D-11 mixture.

D-18.

The **Niagara D-18 Mixture** is the dust applied when **both blight and bugs** are to be combatted. It contains Dehydrated Copper Sulphate or Blue Vitrol, Lime, and Calcium Arsenate in proper proportions. The Calcium Arsenate is a quick acting poison and is very effective against the Potato Bug and other chewing insects. The Dehydrated Copper Sulphate controls blight and many other diseases.

D-5.

Niagara D-5 Mixture is similar to **D-18** save that it contains less poison and should be used when Potato Bugs and other chewing insects are not so serious.

D-6.

The **Niagara D-6 Mixture** contains only Dehydrated Copper Sulphate and Lime (no poison) and is used for the later applications on potatoes when **only blight and other diseases** are to be controlled.

D-11.

If **Aphids or other sucking insects attack** potatoes the **Niagara D-11 Mixture** should be applied. This dust contains $2\frac{1}{4}\%$ nicotine, but no poison or Copper Sulphate. Nicotine dusts have effectively destroyed sucking insects like Aphids. For this purpose Niagara D-11 is unexcelled.

Niagara
138.

Niagara 138 Mixture is the **D-6 Mixture** plus 2% Nicotine and is a **combined fungicide and contact insecticide** for use when blight and aphids are to be controlled. It contains no arsenical poison.

Materials that
Pack Easily
Handled.

Due to the special Niagara construction, Niagara Dusters effectively dust with Arsenate of Lead, Calcium of Arsenate, and Paris Green, which materials ordinarily pack and refuse to flow in a duster.

Quantity Comparison Per Acre

Quantities Per Acre.

Potatoes require 8 to 10 pounds of dust per acre first application, 13 to 15 pounds second application, 18 to 20 pounds third application, and 25 to 30 pounds when vines are full grown. Applications average 20 to 25 pounds during the growing season. A thin film of dust over all surfaces of the vines is enough. It is not necessary to literally coat the plants.

Dust and Spray Comparisons.

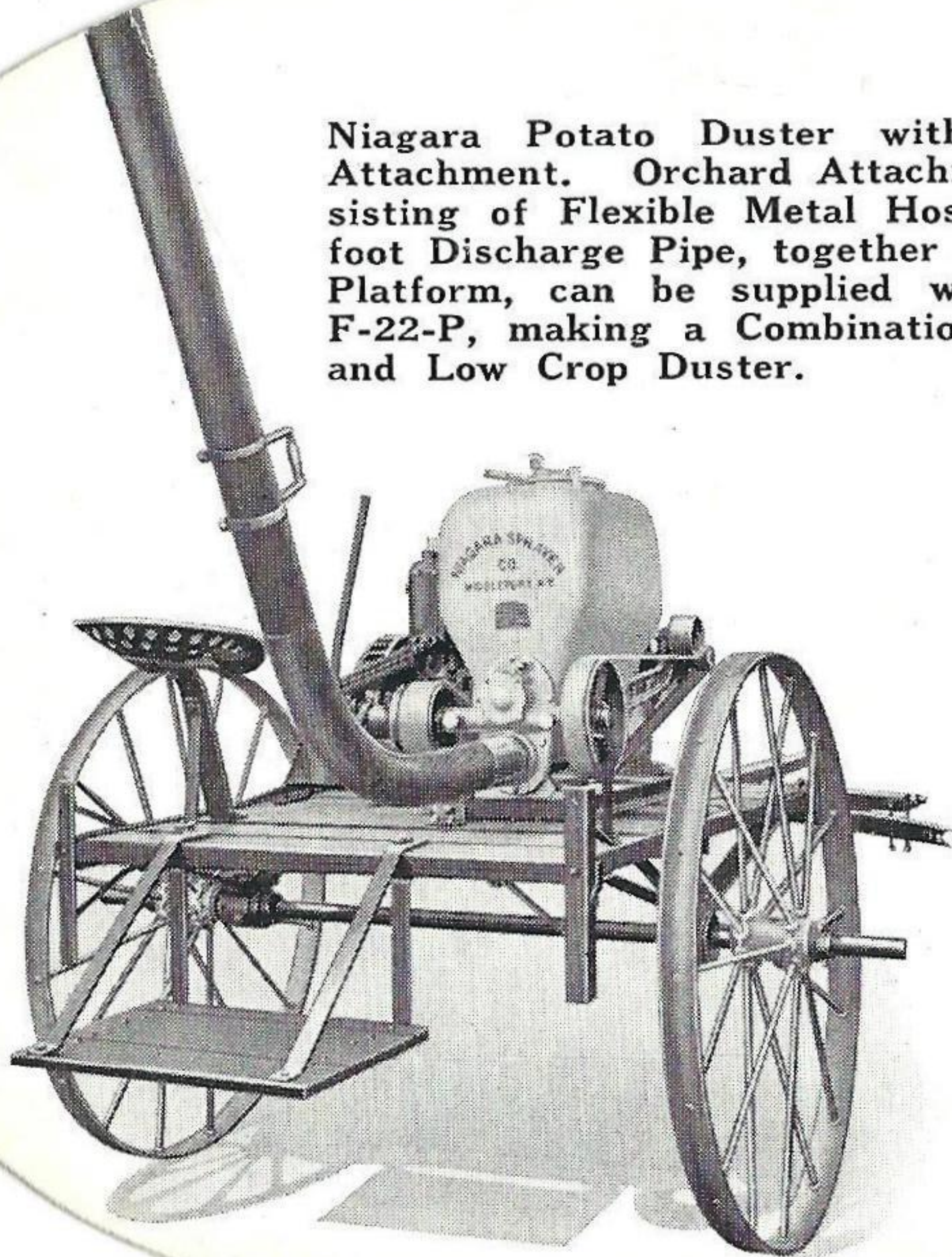
It may be assumed that the potato grower who sprays will average, per acre per application, 50 gallons of liquid Bordeaux of the 4-4-50 formula. (Four pounds Copper Sulphate and four pounds of Lime to 50 gallons of water.) Approximately four pounds of Copper Sulphate (Blue Vitrol) are applied per acre.

More Copper on Foliage.

If 25 pounds of **Niagara Potato Dusts**, containing 20% Dehydrated Copper Sulphate, are used per acre per application in dusting, it is obvious that **five pounds** of this approved specific for control of blight and other diseases reach the vines. **Five pounds of Dehydrated Copper Sulphate equal seven pounds of Copper Sulphate (Blue Vitrol).**

Thus the actual metallic copper dusted upon vines is as 7 to 4 when compared with spraying 4-4-50 liquid Bordeaux.

Niagara Potato Duster with Orchard Attachment. Orchard Attachment, consisting of Flexible Metal Hose with 4-foot Discharge Pipe, together with Drop Platform, can be supplied with Model F-22-P, making a Combination Orchard and Low Crop Duster.



Niagara Hand Blower Gun. Hand Cranked. Dusts $\frac{1}{2}$ Acre per Hour. Straps over Shoulder of Operator. Hopper holds 9 Pounds of Dust. Weight Complete for Service, 20 Pounds.

Directions For Dusting Potatoes

Try Out With Lime.

'Tis best for the grower to try out the duster with lime or other cheap material to get familiar with the machine.

Adjusting Nozzles.

For applications on small potato vines point the nozzles slightly downward. As the vines grow set the nozzles to eject the dust in a horizontal (straight out) stream. For Aphids turn the nozzles upward in order that the material will reach the under surface of the leaves.

Distribute cans of dust at intervals at the ends of the rows so they may be picked up without delay when needed. Begin at the side of the field away from the wind, so that, in turning at the ends of the rows, the operator turns away from the dust cloud just discharged.

Best Time to Dust.

Dusting cannot be done successfully in a strong wind, but potatoes can be dusted effectively in a light breeze. Usually the best time to dust is from sunrise to 9 A. M., and after five in the afternoon.

"Drift" Not Wasted.

Tests show that with an experienced operator less material is wasted in dusting than in spraying. The machines direct the dust to where it is needed, so that no excess need be used in order to reach all parts of the plant. The material which may seem to be wasted is

termed "drift," but this in general settles on adjacent rows, so that in reality a very small percentage of dust is lost.

**Potato
Dusting
Schedule.**

The schedule for dusting potatoes is the same as the spraying schedule. The usual method is to dust first when the plants are 6 inches high and then repeat every two weeks until 3 to 5 applications have been put on. If a driving rain should follow immediately after a dust application, that application should be repeated just as a liquid spraying would have to be repeated under those circumstances.

**Both Surfaces
of Leaves.**

In either spraying or dusting it is highly desirable for the materials to cover both the upper and lower surfaces of the leaves. With the Niagara Duster the dust envelops all parts of the plant in a dust fog, a feature not attainable in spraying.

Spraying necessitates handling 50 pounds of water for every pound of paste or powder placed upon vines.

**Dust Not
Harmful.**

No harmful effects have been recorded from breathing the dust. This is true for both men and horses. Ordinary precautions, however, should be practiced, as there is no need for the operator to come in excessive contact with quantities of dust.

Evidence

Two Men
For Other
Work.

"I have dusted my potatoes this season, with fine results. It is a great labor saver, as one man can do the work while the other two men, who usually mix spray materials, can be at work cultivating."—John Taylor, Capeville, Va., May 27, 1921.

"I have dusted my potatoes this season with your Niagara Duster and consider it ideal."—J. P. Fitchett, Sea View, Va., May 24, 1921.

More
Effective
Than
Spray.

"In regard to dusting with the Niagara Duster, I can say that I am well pleased with using the dust this season, and I intend to use it over my whole acreage next year. I believe that dusting is not only more economical in application, but is more effective for the prevention of blight than the wet spray. The application containing the poison which we used for bugs was the most effective that we ever used."—D. F. Getchell, Limestone, Maine, Oct. 11, 1921.

"Kills pests as well or even better than liquid. Like my duster very much."—P. B. Knight, Limestone, Maine, Oct. 28, 1921.

Evidence

"I am so well pleased with my **Duster** that under no consideration would I again consider a water sprayer."—P. W. Krier, Antigo, Wisconsin.

Compares
With
Neighbors'
Vines.

"We bought **two of your power dusters** the past season and they worked very satisfactorily. My potatoes were greener than my neighbors either side of me who used the wet spray."—L. B. Young, Riverhead, N. Y., Nov. 4, 1921.

"I think very well of it."—Wm. Duffy, Hicksville, Long Island, N. Y., Nov. 1, 1921.

"I find the dust is far ahead of the liquid in killing Aphis and stopping the blight. The dust has a great tendency to stop the potato from rotting, as you can cover the leaves and vines more properly than you can with liquid. Where I used the dust, the potatoes were a great deal better than where I used the liquid."—J. A. Reddy, Poughkeepsie, N. Y., Jan. 18, 1921.

Evidence

"We think this method and material quite successful. The dust cost more than would the liquid spray, but it cost much less to apply, so that there was a saving in favor of the dust."—C. J. Armstrong & Sons, Milford, N. Y., Oct. 21, 1921.

Dusting
Prevented
Rot.

"I have just finished digging my potatoes and find that where the dust was not applied the rot was general and where dust was applied no rot shows."—J. S. Bardwell, Whitney's Crossing, N. Y., Oct. 29, 1921.

"We used dust last season and got fine results. Results so good that the State Potato Association certified our seed. The men would rather handle dust than the wet spray and it is sooner done and much easier."—L. M. Lenington, Wyoming, N. Y.

Increased
100 Bu.
Per Acre.

"Our average yield of field was 358 bushels per acre. Our dusted plots yielded 484 bushels per acre."—Wm. D. Henry & Sons, Eden, N. Y.

"We like dust so well that liquid spray is out of the question. We used the dust on cabbages, potatoes and greenhouse tomatoes."—A. F. Hickman, Eden, N. Y.

Evidence

"The results obtained from dusting potatoes were satisfactory in every way."—I. H. T. Fahy, Bridgehampton, N. Y.

"I used **your dust** for my potatoes with perfect success."—Jacob S. Brill, Poughquag Farms, Poughquag, N. Y.

"We are confident that **the duster** is equal to any water sprayer, if not superior."—Geo. Mehlenbacher, Wayland, N. Y., Sept. 19, 1921.

"We are satisfied that the results we got with dust were as good as from sprayed. Check rows showed half rotten when dug. Dust and sprayed showed no sign of rot and are keeping good at present writing."—Leenhouts Bros., Williamson, N. Y., Jan. 18, 1921.

"We are convinced that dust is the thing to keep blight on potatoes in check."—P. H. Moll, Jr., Williamson, N. Y., Nov. 15, 1921.

"I have used your dust for 2 years on potatoes and am well suited with it."—John Churchill, Fulton, N. Y.

Dusted
With
"Perfect
Success."

Evidence

"I used the **Niagara Duster** on my entire crop of potatoes this year. Will say I intend to dust my whole crop the coming season."—A. J. Edgecomb, Limestone, Maine, Oct. 26, 1921.

Dusting
Costs
Less.

"Dusting makes less work, more quickly done, therefore costs less money."—Earl Bailey, Caribou, Maine, Oct. 27, 1921.

"I am quite satisfied with its work on my potatoes. It is a good deal better than liquid spraying."—Firmin Ouellette, Caribou, Maine, Oct. 28, 1921.

"I have used dust on potatoes and am well satisfied with the results."—C. A. Borden, Shellfield Mills, Nova Scotia.

Superior
For
Blight.

"For two years I have used dust on potatoes exclusively. Faithfully used, I believe it is better preventative of blight than wet spray."—Julian A. Dimock, East Corinth, Vermont.



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